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**Kamen et al.**(10) **Pub. No.: US 2020/0386220 A1**(43) **Pub. Date: Dec. 10, 2020**(54) **PERISTALTIC PUMP**(71) Applicant: **DEKA Products Limited Partnership**,  
Manchester, NH (US)(72) Inventors: **Dean Kamen**, Bedford, NH (US); **John M. Kerwin**, Manchester, NH (US); **Colin H. Murphy**, Cambridge, MA (US); **Christopher C. Langenfeld**, Nashua, NH (US); **Michael J. Slate**, Merrimack, NH (US); **Michael S. Place**, Manchester, NH (US); **Larry B. Gray**, Merrimack, NH (US)(21) Appl. No.: **17/000,538**(22) Filed: **Aug. 24, 2020****Related U.S. Application Data**

(63) Continuation of application No. 15/616,325, filed on Jun. 7, 2017, now Pat. No. 10,753,353, which is a continuation of application No. 14/873,515, filed on Oct. 2, 2015, now Pat. No. 10,202,970, which is a continuation of application No. 13/725,790, filed on Dec. 21, 2012, now Pat. No. 9,677,555, which is a continuation of application No. 13/333,574, filed on Dec. 21, 2011, now Pat. No. 10,453,157, which is a continuation of application No. PCT/US11/66588, filed on Dec. 21, 2011, said application No. 14/873,515 is a continuation-in-part of application No. 13/723,238, filed on Dec. 21, 2012, now Pat. No. 9,759,369, which is a continuation-in-part of application No. 13/723,235, filed on Dec. 21, 2012, now Pat. No. 9,400,873, which is a continuation-in-part of application No. 13/724,568, filed on Dec. 21, 2012, now Pat. No. 9,295,778, which is a continuation-in-part of application No. 13/723,239, filed on Dec. 21, 2012, now Pat. No. 10,108,785, which is a continuation-in-part of application No. 13/723,242, filed on Dec. 21, 2012, which is a continuation-in-part of application No. 13/723,244, filed on Dec. 21, 2012, now Pat. No. 9,151,646, which is a continuation-in-part of application No. 13/723,251, filed on Dec. 21, 2012, now Pat. No. 9,636,455, which is a continuation-in-part of application No. 13/723,253, filed on Dec. 21, 2012.

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(57)

**ABSTRACT**

A peristaltic pump includes a plunger-cam follower, a tube receiver, a spring-biased plunger, a spring, a position sensor, and a processor. The plunger-cam follower engages the plunger cam to follow the plunger cam and to disengage from the plunger cam. The spring-biased plunger is coupled to the plunger-cam follower and the spring biases the spring-biased plunger toward the tube receiver. The position sensor determines a position of the spring-biased plunger when the plunger-cam follower is disengaged from the plunger cam. The processor estimates fluid flow utilizing at least the position of the spring-biased plunger as indicated by the position sensor when the plunger-cam follower is disengaged from the plunger cam and the spring biases the spring-biased plunger against the tube.

